Minimum wage and tolerance for inequality*

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Abstract

We suggest that people advocate for equality also because they fear income losses below a given reference point. Stabilizing their baseline income can make workers more tolerant of inequality. We present evidence of this attitude in the UK by exploiting the introduction of the National Minimum Wage (NMW), which institutionally set a baseline pay reducing the risk of income losses for British workers at the bottom of the income distribution. Based on data from the British Household Panel Survey, we show that workers that benefited from the NMW program became relatively more tolerant of inequality and more likely to vote for the Conservative party.

Keywords: Inequality, Redistribution, Minimum wage, Reference dependency, United Kingdom.

JEL Classification: H10, H53, D63, D69, Z1.

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1 Introduction

Standard economic reasoning suggests that people below the mean income should ask for redistribution (Meltzer and Richard, 1981) and support parties that stand up for inequality reduction (Corneo and Gruner, 2002). However, the individual demand for redistribution is boundedly rational, and low-income groups are often averse to redistributive policies and support anti-egalitarian parties (Roemer, 1998). Why do relatively poor people tolerate inequality and do not advocate for redistribution even if they would benefit from it without bearing its cost? Bénabou and Ok (2001) theorize that "prospects of upward mobility" (POUM) play a crucial role, as low-income people accept inequality to the extent to which they believe they can improve their condition in the future. This hypothesis finds support in the evidence showing how individual beliefs about fair opportunities for social mobility tend to weaken taste for redistribution (Alesina and La Ferrara, 2005; Alesina et al., 2012, 2018). However, people generally form their preferences around specific reference points (Tversky and Kahneman, 1991; O'Donoghue and Sprenger, 2018). New experimental research shows that preferences for redistribution heavily depend on positional concerns (Kuziemko et al., 2014; Fisman et al., 2021; Charité et al., 2015). Following this line of thought, we suggest that the fear of income losses below a given reference point may be an additional driver of redistributive preferences.

Individuals might support a more equal distribution of income also to cope with the instability of their reference point. If this is the case, a measure that institutionally sets and stabilizes the reference income could make people more tolerant of inequality. We provide evidence of this attitude by exploiting the National Minimum Wage (NMW) introduction in the UK in 1999, which institutionally established a baseline pay reducing the risk of income losses for roughly four percent of the UK labour force. Using data from the British Household Panel Survey (BHPS), we can observe workers' preferences for inequality before and after the reform. Exploiting the panel dimension of the data, we show that workers who benefited from the NMW became significantly more tolerant of inequality. This finding persists in different specifications of the control group and is robust to an intention-to-treat approach in which the treatment group contains individuals whose hourly wage was below the NMW for their age in the eighth wave (the year before the reform). The effect is sizable: having benefited from the NMW increases the probability to tolerate inequality by 11 percent. This evidence suggests that preferences for inequality are also driven by reference dependence, as reducing the risk of income losses below the reference point (the guaranteed minimum wage) makes people more willing to accept disparities in the income distribution. We strengthen this result by presenting complementary evidence on voting behavior. People who experienced a wage increase because of the NMW are significantly more likely to vote for the Conservative Party. Having benefited from the NMW raises the probability of voting Conservative by roughly 9 percent. A battery of robustness checks and placebo tests supports the causal interpretation of our results.

Our contribution bridges three strands of the economic literature. The first studies why people develop seemingly unselfish preferences for inequality and redistribution, analyzing the role of prospects and beliefs about social mobility (Piketty, 1995; Bénabou and Ok, 2001; Alesina and La Ferrara, 2005), concerns for the fairness of social competition (Alesina and Angeletos, 2005; Sabatini et al., 2019), positional concerns (Kuziemko et al., 2015), experienced macroeconomic conditions (Giuliano and Spilimbergo, 2014; Roth and Wohlfart, 2018), cultural drivers (Eugster et al., 2011), altruism (Dahlberg et al., 2012; Ghiglino et al., 2021), and civic capital (Algan et al., 2016; Cerqueti et al., 2019). A few studies addressed the potential role of reference dependence. Charité et al. (2015) provide experimental evidence that, when taxpayers have manifest reference points, impartial spectators are reluctant to cause economic losses because they project their loss aversion onto recipients. Gualtieri et al. (2019) show that experiencing the fear of incurring in economic losses due to a natural disaster raises support for redistribution even for those individuals who do not endure any material damage. Martén (2019) finds that the demand for redistribution raises when individuals lose their job and declines when their economic prospects return to the reference

point. We add to this literature by providing causal evidence that people experiencing a reduction in the risk of economic setbacks tend to tolerate inequality more.

The second strand of literature studies the impact of minimum wage policies on employment (e.g. Dickens et al., 1999; Stewart, 2004b,a; Cengiz et al., 2019), fairness perceptions and reservation wages (Falk et al., 2006), wage inequality (Dickens and Manning, 2004; Autor et al., 2008; 2016), firm performance (Draca et al. 2011), consumption (Aaronson et al. 2012), tax compliance (Tonin, 2011), and health outcomes (Adams et al. 2012; Reeves et al., 2017), to name a few. We add to this field by offering an empirical analysis of the impact of a minimum wage program on a so far unexplored outcome. Our contribution shows that measures aimed at reducing inequality can counterintuitively affect preferences for inequality, possibly entailing an electoral penalty for the party that promoted them.

Finally, we connect to studies assessing the impact of reference dependence concerns on economic preferences and behavior such as support for redistribution (Charité et al., 2015; Martén, 2019), risk attitudes (Thaler et al., 1997), job search (Della Vigna et al., 2017), consumption (Karle et al., 2015), and tax compliance (Engstrom et al., 2015). We contribute to this field by providing support to the hypothesis that the fear of economic losses also prompts a change in workers' preferences(Charité et al., 2015; Della Vigna et al., 2017; Martén, 2019), resulting in a stronger support for equality.

The rest of the paper proceeds as follows. In Section 2, we describe our data and empirical strategy. Section 3 presents and discusses of our results. Section 4 offers conclusive remarks.

2 Data and empirical strategy

In this section, we first present the data. Then, we report some descriptive statistics and detail our empirical strategy. In a nutshell, the econometric analysis exploits the panel dimension of the data to assess how workers involved in the NMW scheme changed their preferences for inequality compared to those who did not benefit from the reform. In our baseline specification, the treated group consists of the workers whose wages increased thanks to the NMW scheme. We also implement an *intention-to-treat* approach in which we employ alternative specifications of the treatment group. To corroborate the interpretation of results, we present complementary evidence on the impact of the minimum wage on vote intentions. Finally, we perform placebo tests to check for the validity of our identification.

2.1 Data

The British Household Panel Survey (BHPS) is a longitudinal survey based on a representative sample of the British population (Taylor et al., 2007). It started in 1991 and, though initially designed as an indefinite life panel, ended in 2008, when a new survey replaced it. The BHPS interviews all the permanent members of the household face to face. The questionnaire collects information on economic characteristics, such as employment status, salary, number of worked hours, and on personal attitudes and opinions.

2.1.1 Minimum wage in the BHPS

Focusing on the workers at the lower tail of the wage distribution, the introduction of a baseline pay provides a well-suited framework to study how reference dependence affects individual tolerance for inequality by giving them a precise reference point, under which their wage cannot decline (Falk et al., 2006). In this study, we exploit information on the introduction of NMW in the UK in April 1999. The baseline pay was initially set at £3.6 per hour for workers aged more than 22 and to £3

for those aged between 18 and 21[1]. To collect information on NMW recipients, we use the British Household Panel Survey (BHPS), which, in the ninth wave collected in 1999, asked workers whether their hourly pay increased because of the reform. Interviewees who gave an affirmative response to the question about the NMW form the treatment group in our baseline estimates. Given the panel structure of the BHPS we are able to track these individuals over the time span of our study. To reduce measurement errors, the BHPS only asked about the minimum wage to respondents who did not change employer between the waves before and after the introduction of the NMW. While this probably leads to underestimating the number of workers who increased their pay due to the program, it also allows us to focus on workers with a more stable employment history.

To test the robustness of our baseline specification, we also use other measures of the treatment variable. We perform an intention-to-treat approach in the spirit of Arulampalam et al. (2004) by including in the treatment group those workers whose hourly pay was below the baseline level right before the introduction of the NMW and whose hourly pay was between the minimum wage and 25% more than the NMW in the year of the introduction. Our variable of interest takes a value equal to one for treated individuals and zero otherwise.

2.1.2 Tolerance of inequality

To measure tolerance for inequality, we exploit the 5-point Likert scale with which respondents were asked to score the statement: "People have different views about the way governments work. The government should place an upper limit on the amount of money that any one person can make", 1 meaning "strongly agree" and 5 "strongly disagree". The survey collected responses to this question in waves 2, 4, 6, 8, 11, 13, and 16. This BHPS item has been used to measure preferences for redistribution and attitudes towards inequality in Bjørnskov et al. (2013), Clark and D'Ambrosio (2015), and Arunachalam and Watson (2018), among others.

We re-code the variable into a dummy measuring tolerance for inequality that takes value one if the respondent strongly disagrees, disagrees or neither agrees nor disagrees, and zero otherwise (i.e., if the respondent agrees or strongly agrees), and we label the dummy as "tolerance of inequality" in the tables for the sake of brevity.

To measure respondents' political orientation, we use the question: "If there were to be a General Election tomorrow, which political party do you think you would be most likely to support?". Possible responses are Conservative, Labour, Liberal Democrats or SDP, Plaid Cymru, Green Party, Other party, Other answer, None, Refused, Don't know, and Can't vote. Our variable of interest takes value one for Conservative and zero for all the other parties.

Finally, we draw information from the BHPS to control for some socio-demographic characteristics of respondents, including household income, household size, education, marital status, age, and age squared.

2.2 Descriptive statistics

Treated individuals amount to roughly 2.2 percent of workers. Twenty percent of the individuals in the sample declare to be averse to inequality. Figure 1 shows the incidence of the NMW introduction. From the ninth wave (collected in 1999, the year of the introduction of the NMW), the real hourly wage of minimum wage recipients started to increase significantly, underlining the effect of the policy.

A crucial assumption of our study is that the introduction of a minimum wage gives a clear reference point to the workers. This assumption builds on previous works (see e.g. Falk et al., 2006). Furthermore, we try to show that this is the case also in our data. Indeed, starting from the ninth wave, the BHPS introduced a question asking the hourly wage to the workers in the sample. Figure

[1]Since then, the NMW has been updated every year, usually in October. In April 2019, the baseline was set at £8.21 for those aged more than 25, reaching one of the highest rates in the world.

2 plots the rate of the minimum wage in each year and the mode of the answers to the question asking the hourly wage for our treated individuals. Answers of our treated individuals match almost perfectly the minimum wage rate in every wave of the sample[2]. This evidence further suggests that the minimum wage sets a clear reference point for the workers in the lower tail of the income distribution.

Workers belonging to the treated group are mainly low-educated (around 16% of workers are graduated) and genders are perfectly balanced (51% of workers in the sample are women). Among NMW recipients, 10.6% are housekeeping and restaurant services workers, 13.7% work for personal care and related workers, 13.8% are shop salespersons and demonstrators and 14.6% are domestic and related helpers, cleaners, and launderers.

In table 2 we show that since the introduction of the NMW the workers benefiting of the reform increased the number of worked hours.

Table 1: Summary statistics

Variable	Mean	Std. Dev.	N
Dependent Variables			
"Cap on earnings"			
Strongly Agree	0.043	0.203	32,714
Agree	0.161	0.367	32,714
Neither Agree nor Disagree	0.164	0.37	32,714
Disagree	0.482	0.5	32,714
Strongly Disagree	0.151	0.358	32,714
Tolerance of Inequality (re-coded dependent var)	0.796	0.403	32,714
Vote Conservative	0.101	0.301	21,179
Independent Variables			
NMW	0.024	0.153	32,714
NMW (intention-to-treat)	0.035	0.184	32,714
Pay Increase	0.208	0.406	32,714
Control Variables			
Household Size	3.006	1.223	32,714
Household Income	7.62	0.603	32,714
Age	39.057	11.24	32,714
Degree	0.161	0.367	32,714
Married	0.604	0.489	32,714
Female	0.511	0.5	32,714

Table 2: Worked hours

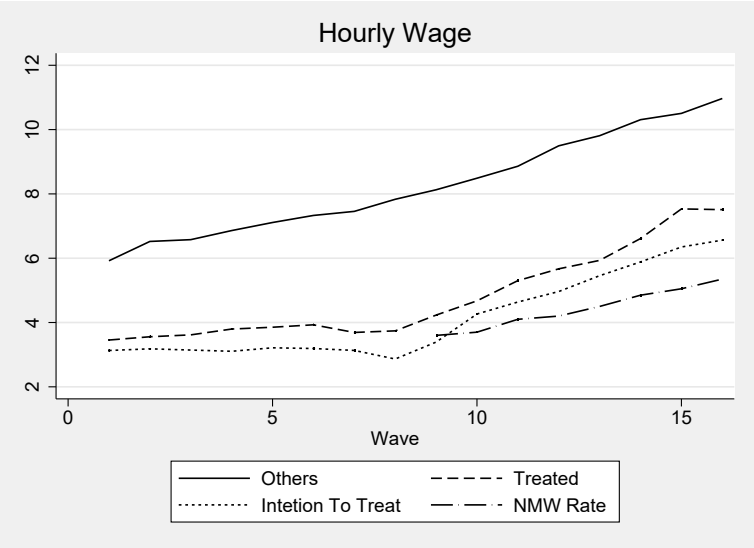
Variable	Before NMW introduction	After NMW introduction	N
NMW	27.87	28.438	2,101
NMW (intention-to-treat)	25.50	28.31	2,790

2.3 Identification

To identify the effect of the minimum wage on tolerance of inequality, we exploit the panel dimension of the data, which allows us to observe preferences for inequality before and after the introduction of

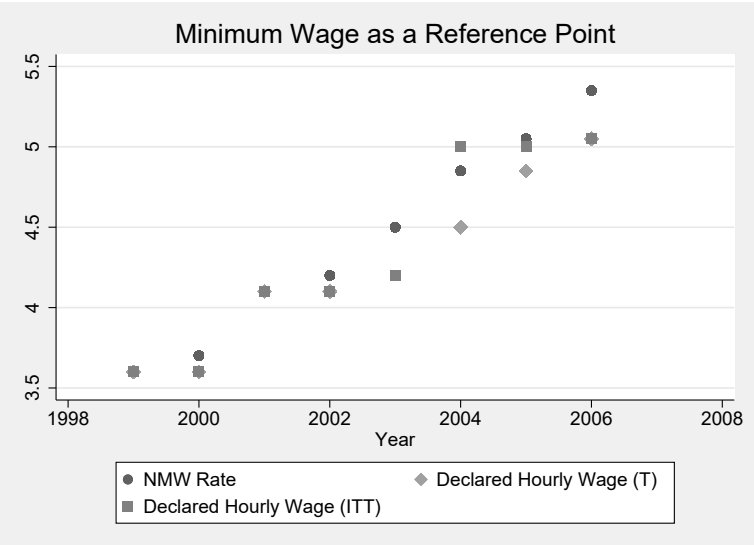
[2]Some measurement error might be due to the fact that annual increases of the NMW occurred in October, and most of the interviews of the BHPS are conducted between September and October.

Figure 1: Evolution of Hourly Wage



Notes: Data show the evoltution of real hourly wages for treated and controls and the nominal rate of the Minimum Wage since introduction.

Figure 2: Declared Hourly Wage



Notes: Data show the mode of the declared nominal hourly wages and the nominal rate of the Minimum Wage. T refers to the treated group, while ITT refers to intention-to-treat.

the NMW – both for the workers affected and unaffected by this policy – and control for individual fixed effects.

The introduction of the NMW entailed the legal obligation to raise all the wages previously lying below the baseline. The threshold was exogenously established by law. Employers and workers could neither chose whether to comply nor affect the baseline pay rate. These circumstances allow us to circumvent the reverse causality and endogenous treatment assignment issues that are usually at stake in the analysis of individual beliefs. It is unlikely that workers self-selected below or above the baseline level according to their attitudes towards inequality, political views, or some experiences or characteristics that may in turn have affected the outcome variables we consider in the analysis. By controlling for individual fixed effects and observing preferences before and after the introduction of the minimum wage, we can avoid the bias potentially caused by time-invariant characteristics that might correlated with preferences for inequality.

We start the empirical analysis by presenting our preferred specification, where the treatment group consists of the workers whose wages increased thanks to the NMW. After assessing the impact of the NMW on the individual tolerance for inequality, we test whether benefiting from the minimum wage made workers more supportive of the Conservative party that represents the most representative pro-market-oriented political party in the UK.

In section 3, we perform the empirical analysis on employed workers aged between 18 and 65 and on those aged 60 years old or less in the ninth wave, in order to drop from the treatment group individuals who were about to retire in the period covered by our study. We also exclude self-employed workers, disabled workers, those who declared a monthly wage lower than £30, and those with a basic hourly pay lower than £1 after the introduction of the NMW. Finally, we drop those who lived in or moved to Northern Ireland as the BHPS extended its sample to Northern Ireland only from the 6th wave.

Our reference linear probability model is:

$$y_{it} = \alpha + \beta NMW_i * Post + \gamma X_{it} + Region_t + Wave_t + \eta_i + \varepsilon_i \ (1)$$

Where y_{it} is a dichotomous variable measuring preferences for inequality, MW_i is our treatment variable that takes value one if the respondent has declared that her hourly pay increased due the introduction of the NMW (or if the worker has been treated according to the alternative specifications) and is interacted with the dummy variable "Post" that takes value equal to one from wave 9 onward (when the NMW kicks in) and zero otherwise. X_{it} is a set of observed time-varying characteristics, including, household size, education, marital status, age, and age squared. We also include regional and wave dummies to control for year and common regional trends. η_i is the individual fixed effect and ε_i is the error term. This approach is a Difference in Differences estimation with individual fixed effects. In Table 3, we illustrate our post-treatment period and the waves in which the BHPS provides measures for our main variables of interest.

Table 3: Treatment period and variables of interest

Waves BHPS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum wage policy (treatment)									✔	✔	✔	✔	✔	✔	✔	✔
Tolerance of iInequality		✔		✔		✔		✔			✔		✔			✔
Conservative voting	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔

To check for alternative explanations of our results and rule out the suspect that they capture spurious correlations driven by a coincidence, we develop several robustness checks and placebo tests in Section 3.3. First, we add to our baseline controls other time-variant controls that might affect our results such as household income and the job ISCO classifications. We also try to control for specific regional shocks including the interaction between region of residence and wave. We then

define an alternative treatment group by considering treated all the individuals whose hourly wage was below the NMW threshold the year before the introduction of the NMW and between the NMW and the 25% of the NMW the year of the introduction.

We control for the possibility that the preferences of NMW recipients are actually reacting to the increase in their wage, rather than to the establishment of a precise reference point that limits the risk of economic losses. To this purpose, we restrict our control group to the workers who experienced a rise in their wages that was unrelated to the NMW in 1999. We also use the group of workers who experienced an increase in their wages as an alternative treatment group to run a placebo test.

We restrict our sample to workers more similar to those in the treatment group by performing our core analysis on two different sub-samples. The first sub-sample comprehends all those workers whose derived hourly wage is equal or below to the average hourly wage of the treatment group. Our treatment group is composed of workers who declared to have benefited from the NMW in the year of the introduction of the NMW. Therefore, some workers might have started to earn systematically more than the minimum wage later in time. With this specification, we exclude this possibility. Furthermore, this sample restriction allows us to narrow our control group only to low-wage workers with pay similar to those benefiting the NMW, but who did not declare to receive wage increases due to the NMW[3]. In the second sub-sample, we analyze the behavior of the specific categories of workers that most benefited from the minimum wage (cooks, waiters, shop sales assistants, domestic helpers, and cleaners). These results are shown in Table A1 in the appendix.

Finally, we administer the treatment three and five years before the introduction of the NMW to control for anticipatory effects. In the appendix, we also show our main results when restricting our sample to individuals who are present in all the BHPS waves.

3 Results

In this section, we present the results of the estimations of the regression model in Equation (1). We then present our baseline assessing the role of the NMW program and some alternative specifications in which we adopt different definitions of the control group, and we employ an intention-to-treat approach. We then analyze the political preferences of treated workers. Finally, we present the results of the placebo analysis.

3.1 Main specification and robustness checks

We assess whether the NMW changed workers' tolerance for inequality by observing their preferences before and after the reform. First, we contrast the treated group of NMW beneficiaries against all the other workers. The assumption is that the introduction of the minimum wage exposed its recipients to a new and salient reference point compared to all the other workers not affected by this policy. We report results in Table 4. Column 1 shows that workers benefiting from the NMW display a lower probability of being inequality averse. The effect is highly statistically significant ($p < 0.01$) and economically sizable. Benefiting from the minimum wage raises the likelihood to tolerate inequality

[3]There can be some reasons why this happens. For example, people in our control group may have changed jobs between the 1998 and 1999, or they did not receive the increase because their employer did not comply (thus breaking the law). Furthermore, it may be that some people in our treatment group got the wage increase even if they were earning exactly the rate of the minimum wage, while this did not happen for those in our control group. This difference is possible because the amount of the wage increase is discretionary to the employer. Some employers might have chosen, for example, to set minimum wages at £4 per hour. In this case, those who were earning between £3.6 and £3.9 per hour were subject to an increase due to the introduction of the national minimum wage even if the national minimum wage was initially set at £3.6 per hour. The data do not allow us to detect which alternative refers to each worker. However, our intention is to test the robustness of our results, and to understand the behavioral effects of setting a precise reference point on worker's wage even when comparing workers with similar wages.

by 11 percent (corresponding to 9 percentage points). As we add controls in models 2 to 4, the significance and the magnitude of the effects are unchanged.

Table 5 shows the results on voting behavior. The baseline model in Column 1 shows that the workers benefiting from the NMW are more willing to vote for the Conservative party. The effect is significant at 5 % level and corresponds to an increase of the 9 percent. However, as we add controls the significance of the effect reduces. The model in column 4 is significant at 10 percent level and shows that having benefited from the NMW increases the probability of voting for the conservative party by 8 percent.

Table 4: The effect of the minimum wage (I)

	(1) Tolerance for Inequality	(2) Tolerance for Inequality	(3) Tolerance for Inequality	(4) Tolerance for Inequality
NMW	0.091***	0.091***	0.089***	0.088***
	(0.029)	(0.029)	(0.030)	(0.030)
Constant	0.504*	0.435	0.857**	0.910**
	(0.299)	(0.303)	(0.436)	(0.443)
Observations	32,714	32,714	32,714	32,714
R-squared	0.011	0.011	0.017	0.021
Number of Individuals	8,570	8,570	8,570	8,570
Basic Controls	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	No
Region FE	Yes	Yes	Yes	No
Household Income		Yes	Yes	Yes
Job Classification ISCO			Yes	Yes
Wave x Region FE				Yes

Notes: The table shows the results of a linear probability model with individual fixed effects. Basic Controls: Age, age squared, education, marital status and household size. Standard errors (in parenthesis) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We then use different treatment and control groups. First, we employ an intention-to-treat approach. In this exercise, the treatment group includes individuals whose hourly wage was below the NMW for their age in the eighth wave (the year before the reform) and whose hourly wage was between the minimum wage and 25% above the minimum wage in the year of the reform. Second, we narrow the control group of our main treatment to workers whose wage was increased in the same year of the national minimum wage introduction, but for reasons unrelated to the minimum wage policy. In the next sub-section, we use this control group also to run a placebo test.

The results in Table 6 suggest that when we use these alternative definitions of the treatment and control group, we find that having benefited from the minimum wage increases tolerance for inequality. The results are very similar to our main results, except that the magnitude of the coefficients slightly decreases when using the intention-to-treat approach. Table 7 displays the results on voting behavior. We find suggestive evidence of an effect of the minimum wage introduction on voting intention, but the results are less significant with respect to our main results.

In Table A1 in the appendix, we run an additional robustness check by splitting the sample. First, we focus on workers whose hourly wage is at most equal to the average hourly wage of our treated individuals. Then, we focus on workers with the same occupations observed in the treatment group. Thus, we keep in the sample cooks, waiters and bartenders, shop sale persons, and domestic helpers/cleaners (following the ISCO International Standard Classification of Occupations). Last, tables A2 and A3 in the appendix show our main results when narrowing the sample using the balanced panel. In any case, the results are similar to those in the main text.

Table 5: The effect of the minimum wage (II)

	(1) Vote Conservative	(2) Vote Conservative	(3) Vote Conservative	(4) Vote Conservative
NMW	0.091**	0.091**	0.088**	0.079*
	(0.042)	(0.042)	(0.041)	(0.041)
Constant	0.323	0.299	0.464**	0.421*
	(0.206)	(0.214)	(0.235)	(0.245)
Observations	21,179	21,179	21,179	21,179
R-squared	0.017	0.017	0.024	0.042
Number of Individuals	5,144	5,144	5,144	5,144
Basic Controls	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	No
Region FE	Yes	Yes	Yes	No
Household Income		Yes	Yes	Yes
Job Classification ISCO			Yes	Yes
Wave x Region FE				Yes

Notes: The table shows the results of a linear probability model with individual fixed effects. Basic Controls: Age, age squared, education, marital status and household size. Standard errors (in parenthesis) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: The effect of the minimum wage (III)

	(1) Tolerance for Inequality	(2) Tolerance for Inequality	(3) Tolerance for Inequality	(4) Tolerance for Inequality
NMW ITT	0.057**	0.056**	0.054**	0.053**
	(0.024)	(0.024)	(0.024)	(0.024)
Constant	0.499*	0.433	0.856**	0.908**
	(0.299)	(0.303)	(0.436)	(0.443)
Observations	32,714	32,714	32,714	32,714
R-squared	0.011	0.011	0.016	0.021
Number of Individuals	8,570	8,570	8,570	8,570
NMW (Control Pay Increase)	0.079***	0.079***	0.082***	0.088***
	(0.030)	(0.030)	(0.031)	(0.031)
Constant	0.742	0.693	0.640	0.631
	(0.703)	(0.710)	(0.716)	(0.726)
Observations	7,597	7,597	7,597	7,597
R-squared	0.021	0.021	0.041	0.059
Number of Individuals	1,708	1,708	1,708	1,708
Basic Controls	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	No
Region FE	Yes	Yes	Yes	No
Household Income		Yes	Yes	Yes
Job Classification ISCO			Yes	Yes
Wave x Region FE				Yes

Notes: The table shows the results of a linear probability model with individual fixed effects. Basic Controls: Age, age squared, education, marital status and household size. Standard errors (in parenthesis) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: The effect of the minimum wage (IV)

	(1) Conservative Voting	(2) Conservative Voting	(3) Conservative Voting	(4) Conservative Voting
NMW ITT	0.037*	0.036*	0.033*	0.033*
	(0.020)	(0.020)	(0.019)	(0.019)
Constant	0.320	0.297	0.463**	0.413*
	(0.206)	(0.214)	(0.235)	(0.244)
Observations	21,179	21,179	21,179	21,179
R-squared	0.016	0.016	0.024	0.042
Number of Individuals	5,144	5,144	5,144	5,144
NMW (Control Pay Increase)	0.092**	0.092**	0.083*	0.073
	(0.045)	(0.045)	(0.043)	(0.046)
Constant	-0.477	-0.551	-0.823	-1.028
	(0.481)	(0.494)	(0.620)	(0.628)
Observations	4,639	4,639	4,639	4,639
R-squared	0.031	0.031	0.062	0.130
Number of Individuals	982	982	982	982
Basic Controls	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	No
Region FE	Yes	Yes	Yes	No
Household Income		Yes	Yes	Yes
Job Classification ISCO			Yes	Yes
Wave x Region FE				Yes

Notes: The table shows the results of a linear probability model with individual fixed effects. Basic Controls: Age, age squared, education, marital status and household size. Standard errors (in parenthesis) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.2 Placebo tests

In the ninth wave of the BHPS (administered in September-December 1999), respondents were asked whether they got any pay increase since April 1999, i.e., the month of the introduction of the NMW, for reasons beyond the NMW introduction. Observed pay increases do not stem from the reform. For example, they may relate to seniority or productivity bonuses. In a first placebo test, we use the workers who answered yes to this question as a placebo-treated group to check whether the effect revealed in our baseline specification is driven by wage increases in themselves, instead of the introduction of a reference point reducing potential wage losses. To perform this exercise, we assign a value equal to one to all the workers who got any pay increase (not due to the NMW introduction).

Results in column one of Table 8 and 9 show that the effect of this placebo-treatment on tolerance for inequality and voting intention is never statistically different from zero. In columns two and three of Table 8 and 9, we also control for anticipatory effects anticipating the treatment in waves 6 and 4.

Table 8: Placebo (I)

	(1) Tolerance of Inequality	(2) Tolerance of Inequality	(3) Tolerance of Inequality
Pay Increase	0.006		
	(0.011)		
NMW wave 6		-0.036	
		(0.050)	
NMW wave 4			0.079
			(0.062)
Constant	0.497*	0.043	0.051
	(0.300)	(0.545)	(0.544)
Observations	32,714	16,386	16,386
R-squared	0.011	0.005	0.005
Number of Individuals	8,570	5,864	5,864
Basic Controls	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes
Region FE	Yes	Yes	Yes

Notes: The table shows the results of a linear probability model with individual fixed effects. Basic Controls: Age, age squared, education, marital status and household size. Standard errors (in parenthesis) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Placebo (II)

	(1) Conservative Voting	(2) Conservative Voting	(3) Conservative Voting
Pay Increase	-0.016		
	(0.015)		
NMW Wave 6		-0.032	
		(0.036)	
NMW Wave 4			0.012
			(0.054)
Constant	0.307	0.576	0.577
	(0.206)	(0.587)	(0.587)
Observations	21,179	7,063	7,063
R-squared	0.016	0.032	0.032
Number of Individuals	5,144	2,770	2,770
Basic Controls	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes
Region FE	Yes	Yes	Yes

Notes: The table shows the results of a linear probability model with individual fixed effects. Basic Controls: Age, age squared, education, marital status and household size. Standard errors (in parenthesis) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4 Conclusion

Our analysis provides robust evidence that British workers whose hourly pay increased thanks to the introduction of the National Minimum Wage (NMW) became more tolerant of inequality. This result is robust to different specifications of the treatment and the control group, and survives to several robustness checks and placebo tests.

A society less tolerant of inequality is more likely to build redistributive mechanisms allowing workers to share the risk of economic setbacks (Alesina and Glaeser, 2004). Thus, people may selfishly advocate for equality and redistribution also because they fear suffering from economic losses. The NMW establishes a clear and salient reference point that prevents the income losses possibly related to wage rate drops below a threshold established by law. Providing workers with the guarantee to avoid such losses weakens their inequality concerns. In support of this interpretation, we provide ancillary evidence that workers who benefited from the minimum wage also changed their vote intentions in favor of a more pro-market-oriented party, unexpectedly harming more inequality-concerned parties like the Labour that introduced the reform in 1999.

Previous research suggests that, if a society believes that socioeconomic success only depends on merit, and that everyone should fully benefit from the fruits of her work, it will demand low redistribution. If, instead, the prevailing belief is that wealth is mostly determined by random "luck", society will likely be more concerned with inequality, thereby supporting higher redistribution (Alesina and Angeletos, 2005; Bénabou and Tirole, 2006). Gualtieri et al. (2019) show that the fear of suffering from the economic losses possibly caused by natural disasters strengthens the belief that redistribution is essential for a society to be fair. The possibility to suffer from economic setbacks due to wage losses could make workers feel more vulnerable to exogenous shocks and the role of luck, thus reinforcing inequality concerns. By contrast, removing the risk of wage losses below a given reference point may make workers feel less vulnerable to unfortunate events, thereby making them more tolerant of inequality.

The finding that NMW beneficiaries softened their inequality concerns also helps explaining why relatively poor people tolerate inequality and do not advocate for redistribution even if they would benefit from it without bearing its cost. The fear to suffer from economic losses likely plays a role, with a lower vulnerability being associated with weaker inequality concerns and support for redistribution. This effect has seemingly paradoxical consequences for the political debate, suggesting that policy measures reducing inequality could affect economically disadvantaged groups' preferences in a way that harms support for more inequality-concerned parties.

The exogeneity of the minimum wage reform allows us to circumvent the reverse causality issues that are usually at stake in the analysis of social preferences. However, it is still possible that confounding factors biased our estimates. Workers may self-select below the NMW threshold according to some personality traits that may correlate both with their attitudes towards inequality and redistribution and their skills, productivity, and wage. The panel structure of the data helps controlling for the influence of such personal features, allowing us to observe workers' attitudes before and after the reform. Nonetheless, further research is needed to understand the mechanisms underlying the relationship between the stabilization of workers' reference income and their redistributive preferences. Manipulations of the reference point in a controlled environment could help better understand the transmission channels of reforms like the NMW that prevent wage losses below a reference point. Our ancillary evidence on the pro-market change in workers' political orientation also is worth of more in-depth investigation, as it involves the political sustainability of redistributive policies. If the benefits of a welfare scheme are not fully understood by the individuals it targets, policymakers may be discouraged from fully implementing it, with a detrimental impact on the targeted population's well-being. Overall, our results add another tile in the extant knowledge about redistributive preferences that help understanding why people develop seemingly unselfish attitudes towards public policies.

References

Aaronson, D., Agarwal, S., and French, E. (2012). The Spending and Debt Response to Minimum Wage Hikes. *American Economic Review*, 102(7):3111–3139.

Adams, S., Blackburn, M. L., and Cotti, C. D. (2012). Minimum wages and alcohol-related traffic fatalities among teens. *Review of Economics and Statistics*, 94(3):828–840.

Alesina, A. and Angeletos, G. M. (2005). Fairness and redistribution. *American Economic Review*, 95(4):960–980.

Alesina, A., Cozzi, G., and Mantovan, N. (2012). The Evolution of Ideology, Fairness and Redistribution. *The Economic Journal*, 122(565):1244–1261.

Alesina, A. and Glaeser, E. (2004). *Fighting Poverty in the US and Europe*. Oxford University Press, Oxford.

Alesina, A. and La Ferrara, E. (2005). Preferences for redistribution in the land of opportunities. *Journal of Public Economics*, 89:897–931.

Alesina, A., Stantcheva, S., and Teso, E. (2018). Intergenerational mobility and preferences for redistribution. *American Economic Review*, 108(2):521–554.

Algan, Y., Cahuc, P., and Sangnier, M. (2016). Trust and the welfare state: The Twin Peaks curve. *The Economic Journal*, 126(593):861–883.

Arulampalam, W., Booth, A. L., and Bryan, M. L. (2004). Training and the new minimum wage. *The Economic Journal*, 114:C87–C94.

Arunachalam, R. and Watson, S. (2018). Height, income and voting. *British Journal of Political Science*, 48(4):1027–1051.

Autor, D. H., Katz, L. F., and Kearney, M. S. (2008). Trends in US wage inequality: Revising the revisionists. *Review of Economics and Statistics*, 90(2):300–323.

Autor, D. H., Manning, A., and Smith, C. L. (2016). The Contribution of the Minimum Wage to US Wage Inequality over Three Decades: A Reassessment. *American Economic Journal: Applied*, 8(1):58–99.

Bénabou, R. and Ok, E. A. (2001). Social mobility and the demand for redistribution: The POUM hypothesis. *Quarterly Journal of Economics*, 116(2):447–487.

Bénabou, R. and Tirole, J. (2006). Belief in a Just World and Redistributive Politics. *Quarterly Journal of Economics*, 121(2):699–746.

Bjørnskov, C., Dreher, A., Fischer, J. A. V., Schnellenbach, J., and Gehring, K. (2013). Inequality and happiness: When perceived social mobility and economic reality do not match. *Journal of Economic Behavior and Organization*, 91:75–92.

Cengiz, D., Dube, A., Lindner, A., and Zipperer, B. (2019). The Effect of Minimum Wages on Low-Wage Jobs. *Quarterly Journal of Economics*, 134(3):1405–1454.

Cerqueti, R., Sabatini, F., and Ventura, M. (2019). Civic capital and support for the welfare state. *Social Choice and Welfare*, 53(2):313–336.

Charité, J., Fisman, R., and Kuziemko, I. (2015). Reference points and redistributive preferences: Experimental evidence. *NBER Working Paper*, (21009).

Clark, A. and D'Ambrosio, C. (2015). *Attitudes to income inequality: experimental and survey evidence*, volume Handbook of Income Distribution. Elsevier, Amsterdam.

Corneo, G. and Gruner, H. P. (2002). Individual preferences for political redistribution. *Journal of Public Economics*, 83:83–107.

Dahlberg, M., Edmark, K., and Lundqist, H. (2012). Ethnic diversity and preferences for redistribution. *Journal of Political Economy*, 120(1):41–76.

Della Vigna, S., Lindner, A., Reizer, B., and Schmieder, J. F. (2017). Reference-dependent job search: Evidence from Hungary. *Quarterly Journal of Economics*, 132(4):1969–2018.

Dickens, R. and Manning, A. (2004). Spikes and Spill-Overs: The Impact of the National Minimum Wage on the Wage Distribution in a Low-Wage Sector. *The Economic Journal*, 114(494):C95–C101.

Dickens, S., Machin, S., and Manning, A. (1999). The effects of minimum wages on employment: Theory and evidence from Britain. *Journal of Labor Economics*, 17(1):1–22.

Draca, M., Machin, S., and Van Reenen, J. (2011). Minimum wages and firm profitability. *American Economic Journal: Applied*, 3(1):129–151.

Engstrom, P., Nordblom, K., Ohlsson, H., and Persson, A. (2015). Tax compliance and loss aversion. *American Economic Journal: Economic Policy*, 7(4):132–164.

Eugster, B., Lalive, R., Steinhauer, A., and Zweimüller, J. (2011). The Demand for Social Insurance: Does Culture Matter? *The Economic Journal*, 121(556):F413–F448.

Falk, A., Fehr, E., and Zehnder, C. (2006). Fairness perceptions and reservation wages - The behavioral effects of minimum wage laws. *Quarterly Journal of Economics*, 121(4):1347–1381.

Fisman, R., Kuziemko, I., and Vannutelli, S. (2021). Distributional preferences in larger groups: Keeping up with the Joneses and keeping track of the tails. *Journal of the European Economic Association*, 19(2):1407–1438.

Ghiglino, C., Juárez-Luna, D., and Müller, A. (2021). Class Altruism and Redistribution. *The Economic Journal*, 131(640):3274–3295.

Giuliano, P. and Spilimbergo, A. (2014). Growing up in a recession. *Review of Economic Studies*, 81:787–817.

Gualtieri, G., Nicolini, M., and Sabatini, F. (2019). Repeated shocks and preferences for redistribution. *Journal of Economic Behavior and Organization*, page https://doi.org/10.1016/j.jebo.2019.09.016.

Karle, H., Kirchsteiger, G., and Peitz, M. (2015). Loss aversion and consumption choice: Theory and experimental evidence. *American Economic Journal: Microeconomics*, 7(2):101–120.

Kuziemko, I., Buell, R. W., Reich, T., and Norton, M. I. (2014). "Last-Place Aversion": Evidence and Redistributive Implications. *Quarterly Journal of Economics*, 129(1):105–149.

Kuziemko, I., Norton, M. I., Saez, E., and Stantcheva, S. (2015). How Elastic Are Preferences for Redistribution? Evidence from Randomized Survey Experiments. *American Economic Review*, 105(4):1478–1508.

Martén, L. (2019). Demand for Redistribution: Individuals' Responses to Economic Setbacks. *The Scandinavian Journal of Economics*, 121(1):225–242.

Meltzer, A. and Richard, S. F. (1981). A rational theory of the size of government. *Journal of Political Economy*, 89(5):914–927.

O'Donoghue, T. and Sprenger, C. (2018). Reference-dependent preferences. In *Handbook of Behavioral Economics: Applications and Foundations 1*, volume 1, pages 1–77. Elsevier.

Piketty, T. (1995). Social mobility and redistributive politics. *Quarterly Journal of Economics*, CX(3):551–584.

Reeves, A., McKee, M., Mackenbach, J., Whitehead, M., and Stuckler, D. (2017). Introduction of a national minimum wage reduced depressive symptoms in low-wage workers: a quasi-natural experiment in the UK. *Health economics*, 26(5):639–655.

Roemer, J. (1998). Why the poor do not expropriate the rich: an old argument in new garb. *Journal of Public Economics*, 70:399–424.

Roth, C. and Wohlfart, J. (2018). Experienced inequality and preferences for redistribution. *Journal of Public Economics*, 167:251–262.

Sabatini, F., Ventura, M., Yamamura, E., and Zamparelli, L. (2019). Fairness and the Unselfish Demand for Redistribution by Taxpayers and Welfare Recipients. *Southern Economic Journal*, DOI: 10.1002/soej.12416.

Stewart, M. B. (2004a). The Employment Effects of the National Minimum Wage. *The Economic Journal*, 114(494):C110–C116.

Stewart, M. B. (2004b). The impact of the introduction of the UK minimum wage on the employment probabilities of low-wage workers. *Journal of the European Economic Association*, 2(1):67–97.

Taylor, M., Brice, J., Buck, N., and Prentice, E. (2007). BHPS User Manual, Volume A: Introduction, Technical Report and Appendices.

Thaler, R. H., Tversky, A., Kahneman, D., and Schwartz, A. (1997). The effect of myopia and loss aversion on risk taking: An experimental test. *Quarterly Journal of Economics*, 112(2):647–661.

Tonin, M. (2011). Minimum wage and tax evasion: Theory and evidence. *Journal of Public Economics*, 95(11-12):1635–1651.

Tversky, A. and Kahneman, D. (1991). Loss aversion in riskless choice: a reference-dependent model. *Quarterly Journal of Economics*, 106(4):1039–1061.

5 Appendix

Table A1: The effect of the minimum wage Sample Split

	(1) Tolerance for Inequality	(2) Tolerance for Inequality	(3) Tolerance for Inequality	(4) Conservative Voting	(5) Conservative Voting	(6) Conservative Voting
NMW	0.091***	0.105***	0.140***	0.091**	0.083**	0.018
	(0.029)	(0.040)	(0.042)	(0.042)	(0.038)	(0.061)
Constant	0.504*	-0.347	1.191	0.323	0.603*	0.631
	(0.299)	(0.770)	(0.912)	(0.206)	(0.340)	(0.567)
Observations	32,714	7,436	5,215	21,179	6,551	4,037
R-squared	0.011	0.019	0.025	0.017	0.022	0.026
Number of Individuals	8,570	3,702	2,205	5,144	2,625	1,479
Sample	Full	Average Pay	ISCO	Full	Average Pay	ISCO
Basic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table shows the results of a linear probability model with individual fixed effects. Basic Controls: Age, age squared, education, marital status and household size. Standard errors (in parenthesis) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A2: The effect of the minimum wage Balanced Panel (I)

	(1) Tolerance for Inequality	(2) Tolerance for Inequality	(3) Tolerance for Inequality	(4) Tolerance for Inequality
NMW	0.103**	0.102**	0.105**	0.105***
	(0.043)	(0.043)	(0.041)	(0.041)
Constant	1.178*	0.998	0.866	0.972
	(0.640)	(0.653)	(0.674)	(0.686)
Observations	7,833	7,833	7,833	7,833
R-squared	0.019	0.020	0.037	0.058
Number of Individuals	1,119	1,119	1,119	1,119
Basic Controls	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	No
Region FE	Yes	Yes	Yes	No
Household Income		Yes	Yes	Yes
Job Classification ISCO			Yes	Yes
Wave x Region FE				Yes

Notes: The table shows the results of a linear probability model with individual fixed effects. Basic Controls: Age, age squared, education, marital status and household size. Standard errors (in parenthesis) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3: The effect of the minimum wage Balanced Panel (II)

	(1) Conservative Voting	(2) Conservative Voting	(3) Conservative Voting	(4) Conservative Voting
NMW	0.220**	0.223**	0.178**	0.196***
	(0.106)	(0.106)	(0.086)	(0.075)
Constant	0.200	0.011	-0.814	-0.998
	(1.069)	(1.098)	(1.128)	(1.196)
Observations	2,725	2,725	2,725	2,725
R-squared	0.050	0.051	0.094	0.198
Number of Individuals	445	445	445	445
Basic Controls	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	No
Region FE	Yes	Yes	Yes	No
Household Income		Yes	Yes	Yes
Job Classification ISCO			Yes	Yes
Wave x Region FE				Yes

Notes: The table shows the results of a linear probability model with individual fixed effects. Basic Controls: Age, age squared, education, marital status and household size. Standard errors (in parenthesis) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$